

List of Exhibits (NMED NOI Attachment 9) – Proposal of New Dairy Rules
Direct Testimony for Rulemaking Hearing
Filed March 8, 2010

Exhibits for Introductory and Background Testimony by William Olson

Exhibit No.	Exhibit Title
WO - 1	Exhibit Summary-Timeline illustrating delays in discharge permit renewal
WO - 2	NMED Ground Water Quality Bureau template for development of dairy facility discharge permits
WO - 3	Letter from W. Olson, NMED-GWQB to W. Bradley, Dairy Farmers of America re: Dairy Industry Group and NMED meetings, August 15, 2008
WO - 4	Senate Bill 206, 2009 regular legislative session
WO - 5	NMED Ground Water Quality Bureau guidelines relevant to discharge permit requirements: monitoring well construction and abandonment, July 2008; synthetically lined lagoons – liner material and site preparation, May 2007; engineering construction plans and specifications, November 2008 - draft
WO - 6	NMED Ground Water Quality Bureau public meeting presentation, June 2009
WO - 7	NMED Ground Water Quality Bureau dairy industry meeting presentation, June 2009
WO - 8	Letter from W. Olson, NMED-GWQB re: cancellation of permittee meetings, dairy discharge regulation development (June 9, 2009)
WO - 9	Letter from R. Curry, Secretary, NMED to Governor Bill Richardson re: establishment of Dairy Discharge Regulations Advisory Committee (June 22, 2009)
WO - 10	Advisory committee members, dairy rule development (June 2009)
WO - 11	Stakeholder list, dairy rule development (October 2009)
WO - 12	Ground Water Discharge Permit and Application Status of Dairy Facilities in New Mexico

Exhibits for Ground Water Contamination Testimony by Sarah McGrath

Exhibit No.	Exhibit Title
SKM - 1	Recent quarterly ground water quality data at dairy facilities as of December 2009
SKM - 2	Historical nitrate-nitrogen contamination in ground water at dairy facilities
SKM - 3	Dairy facility monitoring well data (laboratory analytical reports)

Exhibits for Ground Water Contamination Testimony by Bart Faris

Exhibit No.	Exhibit Title
BF - 1	List of New Mexico dairies where abatement plans have been required
BF - 2	Nitrate+nitrite concentrations, former Price's Valley Gold North Dairy
BF - 3	Perched water potentiometric surface, Cheyenne Dairies
BF - 4	Deeper water potentiometric surface, Cheyenne Dairies

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BF - 5	Nitrate concentrations in perched shallow saturated zone, J&M Dairy
BF - 6	Nitrate concentrations in lower shallow saturated zone, J&M Dairy
BF - 7	Potentiometric surface map, Sun Valley Dairy
BF - 8	Nitrate/nitrite isoconcentration map, Sun Valley Dairy

Exhibits for Section 20.6.2.3200 – Supplemental Permitting Requirements for Dairy Facilities

- No exhibits for this section.

Exhibits for Section 20.6.2.3201 – Purpose

- No exhibits for this section.

Exhibits for Section 20.6.2.3202 – Definitions

- No exhibits for this section.

Exhibits for Section 20.6.2.3203 - Requirements for Discharging from Dairy Facilities

- No exhibits for this section.

Exhibits for Section 20.6.2.3204 – Fees

- No exhibits for this section.

Exhibits for Section 20.6.2.3205 - General Application Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3205 - 1	Exhibit Summary- Renewal application illustrating submittal of inaccurate information
3205 - 2	Exhibit Summary-Timeline illustrating delays in discharge permit renewal
3205 - 3	Senate Bill 206, 2009 regular legislative session

Exhibits for Section 20.6.2.3206 - Application Requirements for New Discharge Permits

- No exhibits for this section.

Exhibits for Section 20.6.2.3207 - Application Requirements for Discharge Permit Renewal or Modification

- No exhibits for this section.

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Exhibits for Section 20.6.2.3208 - Application Requirements for a Discharge Permit for Closure

- No exhibits for this section.

Exhibits for Section 20.6.2.3209 - Additional Public Notice Requirements for Applications for New Discharge Permits

- No exhibits for this section.

Exhibits for Sections 20.6.2.3210 – 20.6.2.3214 [Reserved]

- No exhibits for these sections.

Exhibits for Section 20.6.2.3215 - Procedures for Requesting Public Hearings on Permitting Actions for Dairy Facilities

- No exhibits for this section.

Exhibits for Section 20.6.2.3216 – Setback Requirements for Dairy Facilities Applying for New Discharge Permits

Exhibit No.	Exhibit Title
3216 - 1	Summary of setback requirements in other regulations
3216 - 2	20.7.3 NMAC - Liquid Waste Disposal and Treatment Regulations (partial)
3216 - 3	20.9.4 NMAC - Solid Waste Regulations (partial)
3216 - 4	20.7.10 NMAC - Drinking Water Regulations (partial)
3216 - 5	19.15.17 NMAC – Oil Conservation Division Regulations: Pits, Closed Loop Systems, Below Grade Tanks and Sumps (partial)
3216 - 6	19.15.36 NMAC - Oil Conservation Division Regulations: Surface Waste Management Facilities (partial)
3216 – 7	40 CFR Part 412- Concentrated Animal feeding Operations (CAFO) Point Source Category (partial)

Exhibits for Section 20.6.2.3217 - Engineering and Surveying Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3217 - 1	Exhibit Summary-Timeline illustrating delays in discharge permit renewal
3217 - 2	U.S. Environmental Protection Agency (EPA), EPA/540/R-92/073, "Technical Guidance Document- Construction Quality Management for Remedial Action and Remedial Design Waste Containment Systems"
3217 - 3	State of Nebraska Department of Environmental Quality, "Environmental

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	Guidance Document: Construction Quality Assurance Plan for CAFO Livestock Waste Control Facility”
3217 - 4	20.9.3.21 NMAC and 20.9.4.14 NMAC: Solid Waste Regulations (partial)
3217 - 5	NMED Policy for Storage and Disposal of Dairy Wastes as they relate to Ground Water, December 13, 1996
3217 - 6	40 CFR Parts 9, 122, 123, and 412 (February 12, 2003); 40 CFR Parts 9, 122, and 412 (November 20, 2008)
3217 - 7	Concentrated Animal Feeding Operations Final Rulemaking- Fact Sheet (October 2008)
3217 - 8	Dairy facilities (active and inactive) with nitrate-nitrogen ground water contamination downgradient of impoundments containing wastewater and depth to ground water is less than 50 feet
3217 - 9	U.S. Environmental Protection Agency (EPA), EPA530-R-93-017, “Solid Waste Disposal Facility Criteria- Technical Manual” (partial)
3217 - 10	NMED Construction Programs Bureau, “Recommended Standards for Wastewater Facilities”, 2003 edition
3217 - 11	City of Albuquerque Development Process Manual, Section 7: Supplementary Material for Drainage Submittals
3217 - 12	American Public Works Association, NM Chapter, “New Mexico Standard Specifications for Public Works Construction”, 2006 Edition
3217 - 13	Natural Resources Conservation Service (NRCS), National Engineering Handbook, Part 642: “Specifications for Construction Contracts”
3217 - 14	Geosynthetic Institute, GRI Test Method GM13*, Revision 8 (July 2006); GRI Test Method GM19*, Revision 1 (May 2003)
3217 - 15	U.S. Environmental Protection Agency (EPA), EPA/600/2-88/052, “Lining of Waste Containment and Other Impoundment Facilities” (partial)
3217-16	Exhibit summary – stormwater quality data

Exhibits for Section 20.6.2.3218 - Additional Engineering Design Requirements for Dairy Facilities with a Land Application Area

- No exhibits for this section.

Exhibits for Section 20.6.2.3219 – Additional Engineering Design Requirements for Dairy Facilities Discharging to an Evaporative Wastewater Disposal System

- No exhibits for this section.

Exhibits for Section 20.6.2.3220 - Operational Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3220 - 1	Exhibit re: settled solids measurement
3220 - 2	Exhibit summary – impoundments with excessive manure solids
3220 - 3	<None>

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3220 - 4	Exhibit re: how to measure flow
3220 - 5	Exhibit re: limitations of non-standard flow measurement methods
3220 - 6	U. of Maryland Fact Sheet: Harvesting and Feeding Drought-Stressed Corn
3220-6A	U. of Minnesota: Using Drought-Stressed Corn for Forage
3220-6B	Texas A&M, Texas Agricultural Extension Service: Preventing Nitrate Problems in Drought-Damaged Corn
3220 - 7	Leachate from silage storage: photographs and lab analysis
3220 - 8	Animal mortality composting publications: NM State University, Texas Commission on Environmental Quality; Minnesota Dept. of Agriculture; Iowa Farm*A*Syst
3220-9	40 CFR Part 503: Standards for the Use or Disposal of Sewage Sludge
3220-10	20.7.3 NMAC: Liquid Waste Disposal and Treatment (partial)
3220-11	ASTM D 2487 (Classification of Soils) and D 2488 (Description and Identification of Soils)
3220-12	Exhibit summary – stormwater quality data
3220-13	Photographs of leachate from separated manure solids

Exhibits for Section 20.6.2.3221 - Additional Operational Requirements for Dairy Facilities with a Land Application Area

Exhibit No.	Exhibit Title
3221 - 1	Dou et. al., "Manure Sampling for Nutrient Analysis: Variability and Sampling Efficacy"
3221-1A	Wastewater Quality Data at Dairy Facilities: Magnitude Difference between the Lowest and Highest Total Kjeldahl Nitrogen (TKN) Analysis
3221 - 2	U. of Nebraska NebGuide: Sampling Manures for Nutrient Analysis
3221 - 3	U. of Arkansas, Division of Agriculture: Liquid Waste Animal Sampling
3221 - 4	Iasenza and Babarutsi, "Flow Measurements in Rectangular Basins"
3221-4A	De Kretser, Matthews, and Williams, "Use of Computational Fluid Dynamics to Investigate Natural and Mechanically Induced Flows in an Aerated Lagoon"
3221 - 5	Flynn, "Agronomic Implications of Dairy Effluent Water Reuse"
3221 - 6	Bradford et. al., "Reuse of Concentrated Animal Feeding Operation Wastewater on Agricultural Lands"
3221 - 7	Kurunc, Flynn, and Ulery, "Dairy Lagoon Effluent Effects on Soil Chemical Properties, Corn Yield and Nutrient Uptake"
3221 - 8	Natural Resources Conservation Service (NRCS) Code 590: Nutrient Management
3221-9	U.S. Department of Agriculture: Agricultural Waste Management Field Handbook, Chapter 6 (Role of Plants in Waste Management)
3221-10	Photograph of a mix tank
3221-11	American Society of Agronomy – Certified Crop Advisor Certification; Certified Professional Agronomist
3221-12	NRCS, "Comprehensive Nutrient Management Planning Technical Guidance, New Mexico"

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3221-13	NRCS, "Technical Note No. 1: Profitable Grazing-Based Dairy Systems"
3221-14	Coleman, "Predicting Forage Intake by Grazing Ruminants"
3221-15	Hubbard, Newton, and Hill, "Water Quality and the Grazing Animal"
3221-16	Wells and Dougherty, "Soil Management and Intensive Grazing"
3221-17	Stout et. al., "Nitrate Leaching from Cattle Urine and Feces in Northeast USA"
3221-18	North Carolina Farm*A*Syst, "Grazing Livestock and Water Quality"
3221-19	Photographs of ditch system liners (synthetic and concrete)
3221-20	Uniform Plumbing Code, IAPMO/ANSI UPC 1-2003
3221-21	U. of Southern California, Foundation for Cross-Connection Control and Hydraulic Research – Manual of Cross-Connection Control, Ninth Edition
3221-22	Photographs of mix tanks and air-gap backflow control
3221-23	Diagram of a mix tank for blending dairy wastewater and freshwater
3221-24	19.27.4 NMAC – Well Driller Licensing; Construction, Repair and Plugging of Wells

Exhibits for Section 20.6.2.3222 - Additional Operational Requirements for Dairy Facilities Discharging to an Evaporative Wastewater Disposal System

- No exhibits for this section.

Exhibits for Section 20.6.2.3223 – Ground Water Monitoring Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3223 - 1	Power, Wiese, and Flowerday, "Managing Nitrogen for Water Quality - Lessons from Management Systems Evaluation Area"
3223 - 2	Spalding et. al., "Controlling Nitrate Leaching in Irrigated Agriculture"
3223 - 3	Natural Resources Conservation Service (NRCS), Technical Note No. 1: "Profitable Grazing- Based Dairy Systems"
3223 - 4	Stout et. al., "Nitrate Leaching from Cattle Urine and Feces in Northeast USA"
3223 - 5	19.27.4 NMAC - Well Driller Licensing; Construction, Repair and Plugging of Wells
3223 - 6	State of Wisconsin Department of Natural Resources Regulations, Chapter NR 141- Groundwater Monitoring Well Requirements
3223 - 7	Fletcher, "Groundwater and Wells", Second Edition (partial)
3223 - 8	Fetter, "Contaminant Hydrogeology" (partial)
3223 - 9	ASTM D 5092: Standard Practice for Design and Installation of Ground Water Monitoring Wells
3223 - 10	Certa-Lok Well Casing- PVC Well Products
3223 - 11	Church and Granato, "Bias in Ground-Water Data Caused by Well-Bore Flow in Long-Screen Wells"
3223 - 12	Britt, "Testing the In-Well Horizontal Laminar Flow Assumption with a Sand-

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	Tank Well Model”
3223 - 13	Varljen et. al., “Numerical Simulations to Assess the Monitoring Zone Achieved during Low-Flow Purging and Sampling”
3223 - 14	U.S. Environmental Protection Agency (EPA), EPA/540/S-95/504, “Ground Water Issue: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures”
3223 - 15	State of Ohio Environmental Protection Agency, “Technical Guidance for Ground Water Investigations, Chapter 7: Monitoring Well Design and Installation”
3223 - 16	State of California Environmental Protection Agency, “Monitoring Well Design and Construction for Hydrogeologic Characterization – Guidance Manual for Ground Water Investigations”
3223 - 17	Edil et. al., “Sealing Characteristics of Selected Grouts for Water Wells”
3223 - 18	Christman, Benson, and Edil, “Geophysical Study of Annular Well Seals”
3223 - 19	NMED Ground Water Quality Bureau Inspection Report- Parkland Dairy DP-737 (example of inaccurate well construction logs)
3223 - 20	Letter from W. Olson, NMED-GWQB to W. Bradley, Dairy Farmers of America re: Dairy Industry Group and NMED meetings, August 15, 2008
3223 - 21	NM Office of the State Engineer, Rules and Regulations Governing the Appropriation and Use of Ground Water in New Mexico
3223-22	<None>
3223-23	<None>
3223 - 24	U.S. EPA Region 4: Operating Procedure- Groundwater Level and Well Depth Measurement
3223 - 25	Letter from W. Olson, NMED-GWQB to Chet Wyant, EnviroCompliance Services Inc., re: errors in monitoring well surveys and depth to water measurements at dairies, May 12, 2009
3223 - 26	U.S. EPA Region 4: Operating Procedure- Groundwater Sampling
3223 - 27	Remediation Oversight Section, Ground Water Quality Bureau, NMED, “Sulfate Production and Migration Beneath Dairy Facilities”
3223-28	Exhibit summary – Examples of mislabeling of monitoring wells at dairy facilities

Exhibits for Section 20.6.2.3224 - Monitoring Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3224 - 1	U.S. Environmental Protection Agency (EPA), Method 200.7 – Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry, Revision 4.4 (partial)
3224 - 2	AmTest Laboratories documentation demonstrating availability of sulfur analysis by EPA Method 200.7 and sample cost; Basic Laboratory documentation demonstrating availability of sulfur analysis by EPA Method 200.7
3224 - 3	American Society of Agronomy, “Methods of Soil Analysis” – Part 1:

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	Physical and Mineralogical Methods, 1986 (table of contents); Part 2: Microbiological and Biochemical Properties, 1994 (table of contents); Part 3: Chemical Methods, 1996 (table of contents)
3224 - 4	U.S. EPA NPDES Manual, Chapter 6: Flow Measurement
3224 - 5	Exhibit re: flow meter calibration

Exhibits for Section 20.6.2.3225 - Additional Monitoring Requirements for Dairy Facilities with a Land Application Area

Exhibit No.	Exhibit Title
3225 - 1	Dou et. al., "Manure Sampling for Nutrient Analysis: Variability and Sampling Efficacy"
3225 - 2	Sheffield and Norell, U. of Idaho Extension, "Manure and Wastewater Sampling"
3225 - 3	Wastewater Quality Data at Dairy Facilities: Recent Total Kjeldahl Nitrogen (TKN) Analysis in Wastewater
3225-3A	Metcalf and Eddy, Inc., "Wastewater Engineering: Treatment and Reuse", fourth edition (partial)
3225 - 4	Peters, "Manure Sampling and Testing"
3225 - 5	Iasenza and Babarutsi, "Flow Measurements in Rectangular Basins"
3225-5A	De Kretser, Matthews, and Williams, "Use of Computational Fluid Dynamics to Investigate Natural and Mechanically Induced Flows in an Aerated Lagoon"
3225 - 6	NM State University, College of Agriculture and Home Economics, Bulletin 785 – "Total Nitrogen Content of Dairy Manures in New Mexico"
3225 - 7	<None>
3225 - 8	Flynn, "Nutrient Management Technical Note: Using Harvest Data to Calculate Nitrogen Removal"
3225-9	Natural Resources Conservation Service (NRCS) Code 590: Nutrient Management
3225-10	Flynn, "Appropriate Analyses for New Mexico Soils and General Interpretation of Soil Test Results"
3225-11	California Plant Health Association, "Western Fertilizer Handbook"

Exhibits for Section 20.6.2.3226 - Additional Monitoring Requirements for Dairy Facilities Discharging to an Evaporative Wastewater Disposal System

- No exhibits for this section.

Exhibits for Section 20.6.2.3227 - Contingency Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3227 - 1	Fetter, "Contaminant Hydrogeology" (partial)

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Exhibits for Section 20.6.2.3228 - Additional Contingency Requirements for Dairy Facilities with a Land Application Area

- No exhibits for this section.

Exhibits for Section 20.6.2.3229 - Additional Contingency Requirements for Dairy Facilities Discharging to an Evaporative Wastewater Disposal System

- No exhibits for this section.

Exhibits for Section 20.6.2.3230 - Closure Requirements for All Dairy Facilities

Exhibit No.	Exhibit Title
3230 - 1	Fetter, "Contaminant Hydrogeology" (partial)
3230 - 2	19.27.4 NMAC – Well Driller Licensing; Construction, Repair and Plugging of Wells

Exhibits for Section 20.6.2.3231 - Additional Closure Requirements for Dairy Facilities with a Land Application Area

- No exhibits for this section.

Exhibits for Section 20.6.2.3232 - Additional Closure Requirements for Dairy Facilities Discharging to an Evaporative Wastewater Disposal System

- No exhibits for this section.

Exhibits for Section 20.6.2.3233 - Record Retention Requirements for All Dairy Facilities

- No exhibits for this section.

Exhibits for Section 20.6.2.3234 - Transfer of Dairy Discharge Permits

- No exhibits for this section.

Exhibits for Section 20.6.2.3235 - Continuing Effect of Prior Actions during Transition

Exhibit No.	Exhibit Title
3235 - 1	Ground Water Discharge Permit and Application Status of Dairy Facilities in New Mexico
3235 - 2	Exhibit Summary-Timeline illustrating delays in discharge permit renewal